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ABSTRACT

Since the bulk of Muskingum Area Technical College's income stems from state subsidy based on each Fall quarter's FTE enrollment, it is imperative that enrollment projections for the budgeting process be as realistic as possible. In December 1973, it was decided to use a modified Delphi technique to project enrollment (and subsequent income) for the 1974 Fall quarter. In the interest of expediency, this process was conducted at a series of meetings where the participants were present. Participants included the Dean of Instruction, the Dean of Student Services, the Admissions Officer, the Coordinator of Planning and Development, and the chairman and one faculty member of the department being considered. The participants estimated a Fall 1974 enrollment of 779, which compared favorably to the actual enrollment of 786. However, the estimates were not accurate in projecting the proportion of part-time and full-time enrollment. Whereas projection was made for 602 full-time students, actual full-time enrollment was only 480, and whereas projection was made for 177 part-time students, actual part-time enrollment was 306. Since subsidy is received on the basis of FTE, these inaccurate projections led to inflated budget expectations. (Author/DC)

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PROJECTING COLLEGE ENROLLMENT BY A MODIFIED DELPHI TECHNIQUE

By Richard Coakwell

The annual budgeting process at a collegiate institution is usually faced with a cloudy crystal ball and the hope that all the contingencies surrounding budgeting can be successfully anticipated.

In today's society of rapidly increasing costs, projecting income and subsequent expenditures is faced with a certain amount of trauma and a great deal of uncertainty. Budget adjustments after enrollment is fixed and other income amounts are known is the rule rather than the exception.

At the Muskingum Area Technical College (Zanesville, Ohio) which is a five year old state supported post secondary technical college, the 1974-'75 fiscal year budgeting process was faced with no less concern than is experienced at other institutions. In trying to create a realistic budget, historic information as well as an accurate look at the future was required.

Since the bulk of Muskingum Area Technical College's income stems from state subsidy based on each Fall Quarter's FTE enrollment it is imperative that enrollment projections for the budgeting process be as realistic as is humanly possible. At MATC, historical patterns of Fall Quarter enrollments have been erratic, thus there is no real trend upon which enrollment projections can be solidly based. The institution is also young and changing in many ways, so historical data cannot be totally relied upon.

In December, 1973, it was decided to use the Delphi Technique to project enrollment (and subsequent income) for the 1974 Fall Quarter. The Delphi Technique as reported by the National Laboratory for Higher Education in Research Monography Number Two entitled Identifying Institutional Goals (Encouraging Convergency of Opinion Through The Delphi Technique) by

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Norman P. Uhl served as the model. Following is a description of the procedure as presented in this monography: "The objective of the Delphi Technique is to obtain a consensus of opinions without bringing individuals together in a face-to-face meeting; this is achieved by having them complete a series of questionnaires interspersed with controlled opinion feedback."

"The general procedure for the Delphi Technique is as follows: (1) the participants are asked to list their opinions on a specific topic, such as scientific predictions or recommended activities; (2) the participants are then asked to evaluate the total list by criterion, such as importance, chance of success, etc.; (3) each participant receives the list and a summary of responses to the items and, if in the minority, is asked to revise his opinion or indicate his reason for remaining in the minority; and (4) each participant again receives the list, and updated summary, minority opinions, and a final chance to revise his opinions."

It is not the intent of this article to discuss the Muskingum Area Technical College's budgeting process, which is probably not much different than other colleges and universities but to explore the strengths and weaknesses surrounding use of the Delphi Technique in enrollment projecting.

The budgeting timetable at the college was geared to approval by the Board of Trustees in March, 1974, so salary increases could be determined and 1974-75 academic contracts distributed in early April.

At the Muskingum Area Technical College the Delphi process using questionnaires was modified in the interest of expediency. Since the budgeting timetable was a tight one it was decided to conduct the process at a series of meetings where participants were present. It was recognized that the danger of one person or a group might become a dominant force in these face-to-face sessions thus influencing the process and the outcome unduly.

In this modified Delphi process it was imperative that the chairman exercise close control of the process and not permit a dominant personality to subdue less outspoken participants or the "selling" of a point of view.

Following is the process employed in this exercise:

Delphi Technique

A. Each committee member is requested to personally write his or her enrollment estimate for the technology as follows:

1. Summer Quarter - Full-Time _____
2. Summer Quarter - Part-Time _____
3. Summer Quarter - Total _____
4. Fall Quarter - Full-Time _____
5. Fall Quarter - Part-Time _____
6. Fall Quarter - Total _____

B. These estimates are submitted to the Chairman who computes the range and arithmetic mean for 1-6 above and then advises the committee.

C. Those who estimated on the extremes of the range are asked to justify their estimate and provide any additional insight which they may have to the others. Each other member of the committee is requested to briefly add any additional remarks which he might like to make.

D. Items "a" through "c" are repeated at least two additional times with the final round serving as the enrollment estimates for that technology.

The Delphi Technique as employed here allows an institution to use the wisdom and input of all college personnel who have some factual information about present and future enrollment at the institution. Each participant provides an initial estimate which is averaged and a range established. Discussion or reasoning by those at either extreme of the range provides information to all other participants.

At MATC using the modified Delphi Technique, a series of meetings for each department was established where the departmental chairman would discuss estimates and share other information known to them that was pertinent to

future enrollment in their department. A faculty member closest to each of the 17 technologies within the departments would meet at the time scheduled for his technology enrollment to be projected. Each technology projection would then also permit budgeting by department for the number of students anticipated and a total estimated enrollment derived for the institution which could then be used for budgeting fiscal year income and expenditures.

Participants in the modified Delphi process included the Dean of Instruction, Dean of Student Services, Admissions Officer, Coordinator of Planning & Development who served as chairman, and the respective Department Chairman with his appropriate technology faculty member.

It is worthy to note that some participants sat at each session giving stability and consistency to the process. Those participating at each session included the Dean of Instruction, Dean of Student Services, Admissions Officer, and Coordinator of Planning & Development.

Before the individual technologies met for their rounds of estimating, the Administrative Council of the college made a trail run at projecting the total institution enrollment. The ten people comprising the Council which includes all department chairmen and five college administrators made initial Fall 1974 projections based on the historical information and future trends or data they possessed. Subsequent rounds refined the estimates and narrowed the range until it was felt further discussion would effect little change. The Council estimated 761 total students enrolled Fall Quarter 1974 (see Table I) which compared favorably to individual technology projections of 779 part-time and full-time students arrived at in later sessions.

To begin the Delphi Technique with the various departments the schedule was set allowing an hour for each technology program within a department. The schedule was completed on time within a four day period.

An advance memorandum to all faculty and administration detailed the Delphi procedures that would be used. Information and data input assignments were spelled out to all appropriate participants. Following are the assignments that were made:

A. Previous MATC 1974 projected enrollment and percent increases (or decreases) for Summer and Fall Quarters - Business Manager

B. Previous Ohio Board of Regents 1974 projected enrollment and percent increases (or decreases) for Summer and Fall Quarters - Coordinator of Planning & Development

C. Summer, Fall & Winter Quarters, 1973, Technology Enrollment - Dean of Student Services

D. Technology applications received and general interest to date - Admissions Officer

E. Prospects as seen by Department Chairman

F. Prospects as seen by Technology Instructor

G. Prospects as seen by other committee members

Any other information that a participant felt would be useful in discussions was to be brought to the sessions. A handout sheet reflecting positive and negative factors that could effect enrollment was prepared and distributed prior to the sessions (see Exhibit I).

At the scheduled sessions each participant was reinformed of the details of the process to be used and given sheets to record estimates, ranges and means for each of the three rounds.

Table I reflects the results by department and technology for freshman and sophomore Fall and Summer 1974 part-time and full-time head count projections.

Sophomore enrollment was projected for 1974 using current 1973 data and assuming an historical attrition percentage or other unusual circumstances as described by department people during discussions. For comparative purposes the college's actual Fall 1973 enrollments are shown.

Table II summarizes the final range and mean by level of student for the institution as a whole. Only time and actual enrollment for Summer and Fall Quarters 1974 will prove the degree of success which is achieved through this process.

The success of using the modified Delphi Technique as conducted at MATC where each participant is present, hinges on the ability of the Delphi chairman to prevent a dominant personality from unduly influencing a more reserved person. Attempts to "sell" a point of view were not permitted, only information sharing was allowed. Secondly, the Delphi chairman needed to be able to sense when members felt no new information was available and to call for estimates or in a final round and a convergence of opinion reached, terminate the process.

In the final analysis one could say that enrollment projecting could have been completed more quickly and easily using traditional "guesstimates". This line of thinking is true where "quick and dirty" projections are acceptable. However, it is felt that the modified Delphi Technique as discussed here makes the projecting of enrollments as scientific as the process can be.

The modified Delphi Technique as described here brings together all available expertise in enrollment forecasting in an institution from faculty through general administration. Facts of existing circumstances provided by the experts replace emotional conjecturing and extension of past mistakes where proper control by the chairman is exercised.

Final enrollment data for Fall Quarter 1974 for which Delphi projections were made indicated 779 total students were projected while enrollment was actually 786 (See Table II).

Although prediction of total enrollment was quite good our experience at predicting full-time and part-time was not good. Where prediction was made for 177 part-time students actual enrollment was 306. Where prediction was 602 full-time students actual enrollment was 480.

Although total enrollment was close to prediction the key to budget preparation for which the modified Delphi method was used was inaccurate from the standpoint that subsidy received by the institution was actually reduced due to lower FTE data as reflected in fewer full-time students enrolled.

Experience with this process indicates that closer attention must be paid to predicting FTE enrollment than headcount enrollment as determined here.

EXHIBIT I

FACTORS THAT EFFECT ENROLLMENT

POSITIVE FACTORS

1. Evening and Saturday classes have not yet realized their potential.
2. New off-campus classes.
3. Record freshman enrollment which should contribute to increased sophomore enrollments.
4. Only about 20% of the high school graduates in our 6 county service area are attending a post-secondary institution.
5. Definite recruiting plan by the Admissions Office now developed.
6. Increased publicity and public relations efforts are continually increasing public awareness.
7. Next Fall's freshmen will spend sophomore year and graduate in the new facilities.
8. New target population of older adults being emphasized.
9. Today's emphasis on vocational and technical education aimed at population for employment.
10. Fifteen per cent increase this year in Ohio technical college enrollments.
11. High quality instruction now prevalent at MATC.
12. Individual efforts by faculty to encourage program and development.
13. Continuing education program will foster better information about MATC programs.
14. MATC's low cost.

NEGATIVE FACTORS

1. Potential gas shortage and gas cost increases for commuting student.
2. Trend in attrition over previous year.
3. Continuing misunderstanding of the distinction between MATC and nearby Joint Vocational School.
4. Reducing number of high school graduates (no immediate effect, however).
5. True salary and position potential of graduates commensurate with a quality two-year college education has not yet been realized.
6. University transfer problems.
7. Elimination of the draft.

TABLE I

STUDENT HEAD COUNT ENROLLMENT - FALL AND SUMMER 1974

Dept./Technology	Fall 1973 (Actual) Freshman P.T.	F.T.	Sophomore P.T.	F.T.	Total P.T.	F.T.	Fall 1974 (Projected) Freshman P.T.	F.T.	Sophomore P.T.	F.T.	Total P.T.	F.T.	Summer 1974 (Projected) P.T.	F.T.
ENVIRONMENTAL SCIENCE														
Air Quality Control	0	3	1	7	1	10	4	12	0	3	4	15	9	0
Water Quality Control	1	14	0	13	1	27	6	22	0	10	6	32	12	1
Natural Resources Conservation	3	35	0	13	3	48	8	32	0	22	8	54	24	3
Surveying	--	--	--	--	--	--	10	17	--	--	10	17	--	--
Total	4	52	1	33	5	85	28	83	0	35	28	118	45	4
HUMAN RESOURCES														
Mental Health	4	31	0	16	4	47	8	32	0	20	8	52	21	2
Child Development	3	37	0	16	3	53	6	34	2	25	8	59	24	4
Law Enforcement	13	29	0	9	13	38	25	36	0	21	25	57	32	5
Total	20	97	0	41	20	138	39	102	2	66	41	168	77	11
BUSINESS														
Accounting	16	10	0	10	16	20	18	19	0	8	18	27	9	2
Business Administration	16	33	0	18	16	51	20	31	0	20	20	51	20	5
Secretarial Science	9	30	4	10	13	40	15	34	0	18	15	52	23	4
Marketing	2	17	0	10	2	27	6	18	0	13	6	31	11	2
Computer Science	10	15	1	7	11	22	8	15	0	10	8	25	7	1
Total	53	105	5	55	58	160	67	117	0	69	67	186	70	14
ENGINEERING														
Architectural Drafting	3	36	0	15	3	51	9	32	0	24	9	56	20	7
Electrical Engineering	9	25	1	15	10	40	20	25	0	18	20	43	16	3
Mechanical Engineering	4	9	1	11	5	20	4	19	0	7	4	26	8	3
Industrial Engineering	4	2	1	0	5	2	8	3	0	2	8	5	0	0
Total	20	72	3	41	23	113	41	79	0	51	41	130	44	13
GRAND TOTAL	97	326	9	170	106	496	175	381	2	221	177	602	236	42
					602						779*			

*Totals independently projected by Administrative Council = 178 P.T. & 583 F.T. (761)

TABLE II

DELPHI PROJECTIONS

Ranges and Totals by Level For Fall Quarter 1974

	Full Time		
	Low	High	Mean
Freshman	327	445	381
Sophomore	221	221	221
Total	548	666	602

	Full Time & Part Time		
	Low	High	Mean
Freshman	480	655	556
Sophomore	223	223	223
Total	703	878	779

Actual 1974 Enrollment

Freshman	579
Sophomore	207
Total	786

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